

Stated Meeting, February 7, 1890.

Present, 8 members.

Prof. EDWIN J. HOUSTON in the Chair.

Correspondence was submitted as follows :

Letters from Sir George G. Stokes, F.R.S., London, and Dr. Friederich S. Krauss, Vienna, accepting membership in the Society.

A letter from the Physikalisch-Oekonomische Gesellschaft zu Königsberg in Preussen, announcing the approaching Centennial Anniversary of its formation (February 22, 1890).

An invitation from Columbia College, New York city, N. Y., to be present by delegate at the inauguration of Seth Low as President, on February 3, 1890.

Letters of envoy were received from the K. Leopoldinisch-Carolinische Akademie, Halle a. S.; Meteorological Office, London.

Letters of acknowledgment were received from the Royal Society of Victoria, Melbourne (129); Naturwissenschaftlicher Verein des Regierungs-Bezirks, Frankfurt a. O. (129); K. Leopoldinisch-Carolinische Akademie, Halle a. S. (129); Prof. J. Victor Carus, Leipzig (127, 128); Société des Sciences Physiques et Naturelles, Bordeaux (129); Sir Monier Monier-Williams, London (128, 129); Hon. J. M. LeMoine, Quebec (129, 130); Nova Scotian Institute of Natural Science, Halifax (96-130, Catalogue, etc.); Anthropological Society, Washington, D. C. (125, 126, 127, 128); Prof. James B. Angell, Ann Arbor (129); Geological Survey of Missouri, Jefferson City (129, 130, Catalogue, etc.).

Letters of acknowledgment (130) were received from the Geological and Natural History Survey, Ottawa, Canada; University of Toronto, Canadian Institute, Toronto; Maine Historical Society, Portland Society of Natural History, Portland, Me.; Northern Academy of Arts and Sciences, Prof.

C. H. Hitchcock, Hanover, N. H.; Mr. John G. Whittier, Amesbury, Mass.; Boston Athenæum, State Library of Massachusetts, American Statistical Association, Boston Society of Natural History, Massachusetts Historical Society, Hon. Robert C. Winthrop, Boston; Harvard College Library, Museum of Comparative Zoölogy, Profs. Alexander Agassiz, Joseph Lovering, Robert N. Toppan, Cambridge, Mass.; Mr. James B. Francis, Lowell, Mass.; Free Public Library, New Bedford; Dr. Pliny Earle, Northampton; Essex Institute, Salem; American Antiquarian Society, Worcester; Rhode Island Historical Society, Prof. Thomas Chase, Providence; Connecticut Historical Society, Hartford, Conn.; New Haven Colony Historical Society, Profs. H. A. Newton, W. D. Whitney, New Haven, Conn.; Profs. James Hall, Edward North, C. H. F. Peters, Clinton, N. Y.; New York Hospital, Astor Library, Dr. Daniel Draper, New York State Library, New York Historical Society, Columbia College Library, Prof. Joel A. Allen, Messrs. J. Douglas, R. W. Raymond, Dr. J. J. Stevenson, New York; Vassar Brothers' Institute, Poughkeepsie; Oneida Historical Society, Utica; U. S. Military Academy, West Point; Mr. William John Potts, Camden; New Jersey Historical Society, Newark; Prof. C. F. Brackett, Princeton; Dr. Charles B. Dudley, Altoona, Pa.; Academy of Natural Science, College of Physicians, Wagner Free Institute, Pennsylvania Hospital, Numismatic and Antiquarian Society, Messrs. Harrison Allen, John Ashhurst, Richard L. Ashhurst, R. Meade Bache, Cadwalader Biddle, George D. Boardman, W. G. A. Bonwill, Arthur E. Brown, Samuel Castner, Jr., Henry C. Chapman, C. H. Clark, Thomas M. Cleemann, E. D. Cope, Samuel Dickson, Patterson du Bois, Persifor Frazer, F. A. Genth, Jr., Daniel R. Goodwin, William H. Greene, H. V. Hilprecht, E. J. Houston, Francis Jordan, Jr., E. Otis Kendall, Joseph Leidy, Francis W. Lewis, Morris Longstreth, E. Y. McCauley, F. A. Mühlberg, Isaac Norris, Charles A. Oliver, C. Stuart Patterson, C. N. Peirce, William Pepper, Henry Phillips, Jr., Franklin Platt, Theodore D. Rand, George B. Roberts, W. S. W. Ruschen-

berger, Lewis A. Scott, Aubrey H. Smith, Albert H. Smyth, George Stuart, William P. Tatham, William Thomson, H. Clay Trumbull, David K. Tuttle, William H. Wahl, Ellis Yarnall, Mrs. Helen Abbott Michael, Philadelphia; Dr. Robert H. Alison, Ardmore; Prof. E. B. Wilson, Bryn Mawr; Prof. Lyman B. Hall, Haverford; Mr. Philip C. Garrett, Logan, Phila.; Mr. J. Vaughan Merrick, Roxborough; Mr. Burnet Landreth, Bristol; Mr. Eckley B. Coxe, Drifton; Dr. Traill Green, Profs. James W. Moore, Thomas C. Porter, Easton; Linnean Scientific and Historical Society of Lancaster, Pa.; Mr. Peter F. Rothermel, Linfield; Mr. John F. Carll, Pleasantville; Mr. Peter W. Sheafer, Pottsville; Mr. M. Fisher Longstreth, Sharon Hill, Pa.; Philosophical Society, Mr. Philip P. Sharpless, West Chester; State Library of Pennsylvania; Mr. Andrew S. McCreath, Harrisburg; Naval Institute, Annapolis, Md.; Maryland Institute, Baltimore; Library of the Surgeon-General's Office, Anthropological Society, U. S. Naval Observatory, Smithsonian Institution, Messrs. S. F. Emmons, Albert S. Gatschet, Thomas J. Lee, Garrick Mallery, Charles A. Schott, William B. Taylor, Lester F. Ward, Washington, D. C.; Virginia Historical Society, Richmond; Prof. John W. Mallet, University of Virginia; Prof. Lyon G. Tyler, Williamsburg, Va.; Elliott Society of Science and Art, Charleston, S. C.; Georgia Historical Society, Savannah; University of Alabama, Tuscaloosa; Prof. E. W. Claypole, Akron, O.; Denison University, Granville, O.; Society of Natural History, Cincinnati Observatory, Hon. J. D. Cox, Prof. James M. Hart, Cincinnati; Rev. Henry S. Osborn, Oxford, O.; Dr. Robert Peter, Lexington, Ky.; Athenæum, Columbia, Tenn.; St. Louis Academy of Science; Profs. James B. Angell, Alexander Winchell, Ann Arbor; Gen. William F. Reynolds, Col. William Ludlow, Detroit; Prof. John C. Branner, Little Rock, Ark.; Davenport Academy of Natural Sciences; Iowa University Library, Iowa City; Kansas State Historical Society, Washburn College, Topeka, Kans.; Prof. John L. Campbell, Crawfordsville, Ind.; Chicago Historical Society, Newberry Library, Chicago, Ill.; State Historical

Society of Wisconsin, Madison; Colorado Scientific Society, Denver; Prof. Joseph Le Conte, Berkeley, Cal.; Prof. Daniel Kirkwood, Riverside, Cal.

Accessions to the Library were announced from the K. Böhmishe Gesellschaft der Wissenschaften, Prag; K. K. Geologische Reichsanstalt, K. Akademie der Wissenschaften, Vienna, Austria; Gesellschaft für Anthropologie, etc., Deutsche Geologische Gesellschaft, Gesellschaft für Erdkunde, Messrs. Friedländer & Son, Berlin; Senckenbergische Naturforschende Gesellschaft, Naturwissenschaftliche Verein des Reg.-Bez., Frankfurt a. M.; Verein für Erdkunde, K. Leopoldina Carolina Akademie, Halle a. S.; Sociedade de Geografia, Lisbon; Meteorological Council, Society of Arts, Prof. B. Loewenberg, London; Trustees of Prof. James Henry, Dublin; Nova Scotian Institute of Natural Science, Halifax; Natural History Society, Montreal; Theological Seminary, Andover; American Statistical Association, Hon. Robert C. Winthrop, Boston; Museum of Comparative Zoölogy, Prof. Samuel D. Scudder, Cambridge, Mass.; Essex Institute, Salem; Editor of "The Traveller's Record," Hartford; Meteorological Observatory, American Institute of Electrical Engineers, New York; Mr. William John Potts, Camden, N. J.; American Pharmaceutical Association, Wagner Free Institute, Editor of "The Naturalist's Leisure Hour," Daniel G. Brinton, I. Minis Hays, Henry Phillips, Jr., Philadelphia; Pennsylvania Geological Survey, Harrisburg; Prof. Ira Remsen, Baltimore; Treasury Department, Smithsonian Institution, Department of the Interior, U. S. Coast and Geodetic Survey, Hydrographic Office, Anthropological Society, Washington, D. C.; Charles C. Jones, Jr., Augusta, Ga.; State Board of Health, Nashville, Tenn.; Public Library of Cincinnati; State Historical Society, Iowa City, Ia.; Wisconsin Academy of Sciences, Arts, etc., Madison; Washburn College Laboratory of Natural History, Topeka, Kans.; Los Angeles Public Library; University of California, Sacramento; Observatorio Meteorologico-Magnetico Central, Observatorio Astronomico Nacional de Tacubaya, Sociedad Cientifica "Antonio Alzate," Mexico; Museo

Michoacano, Morelia, Mexico; Deutsche Wissenschaftliche Verein, Santiago, Chili.

The death of Gustav Adolph Hirn, Colmar, Alsace, January 14, 1890, æt. 75, was announced.

Dr. Daniel G. Brinton presented a paper on "Etruscan and Libyan Names."

Prof. Houston made a communication on "Muscular Contractions following Death by Electricity."

Pending nominations Nos. 1203, 1204, 1205, 1206, 1207, 1208 were read.

On motion, the Society subscribed to "American Notes and Queries," and ordered the purchase of the three previous volumes.

Dr. Oliver reported the following preamble and resolutions, which were adopted, and the same committee continued and requested to make all the arrangements necessary to carry out the same:

The Committee to which was referred the following preamble and resolution: "Deeming it both honorable and just that we, the present representatives of American Philosophical Society, should show our affection and regard for our illustrious Founder and First President, Dr. Benjamin Franklin, who died on the 17th day of April, 1790, be it resolved that we commemorate his life, his wisdom, his labors and his achievements by proper and fitting ceremonies becoming such an occasion, on the 17th day of April, 1890; the form of the commemoration to be referred to a special committee of five members, who shall be empowered to take all necessary action," presented by Dr. Oliver at the meeting of the Society on the 17th of January, 1890, begs respectfully to submit the following report:

Resolved, That we commemorate in a becoming manner the approaching Centennial Anniversary of the death of Benjamin Franklin.

Resolved, That a series of short addresses upon his life, character and work be delivered before the Society upon this occasion.

The Committee on the Michaux Legacy reported in favor of an appropriation of \$150 to assist the expedition of Prof. Heilprin to investigate the forest growths of Mexico and Yucatan; and on motion the amount was granted for the purpose.

The Finance Committee offered the following resolution which was adopted:

Resolved, That J. Sergeant Price, Treasurer, be and he is hereby authorized to sell and transfer three thousand dollars of the loans of the City of Philadelphia now standing in the name of the Society.

And the Society was adjourned by the presiding member.

On Muscular Contractions Following Death by Electricity.

By Prof. Edwin J. Houston.

(Read before the American Philosophical Society, February 7, 1890.)

Accurate data are wanting as to whether death resulting from accidental contact with electric conductors conveying the powerful currents employed in systems of electric lighting or power distribution is, or is not, practically instantaneous. Certain facts, however, are known which show that when the nature of the contacts is such that the discharge passes through the respiratory, the cardiac or the brain centres, that true physiological death, as evidenced by the complete failure of these centres to perform their normal functions, and their inability to afterwards perform these functions, is practically instantaneous.

In cases of death from a lightning bolt, for example, instances are on record where death has been so nearly instantaneous that the bodies have remained so nearly in the positions occupied during life that passers-by have failed to recognize the presence of death.

On the regaining of consciousness lost by a lightning discharge or a contact with an electric conductor, the subject as a rule has no memory of pain or suffering, and in many instances is even ignorant of the cause of the accident.

A fact, however, which appears to disprove that practically instantaneous physiological death follows a powerful electric discharge, should be alluded to. In some instances, it has been observed that the body of the person receiving the discharge showed prolonged convulsive muscular contractions and contortions. The question thus arises, Do such muscular movements necessarily prove actual suffering on the part of the subject? Do they even necessarily prove the existence of life while they are taking place? While, of course, the answer to this question must necessarily be to a certain extent uncertain, the following considerations are offered to show that in all probability such muscular contractions follow physiological death, and are, therefore, unattended by consciousness or suffering.

Two general cases of contact resulting in death may occur, viz.:

1. A momentary contact, where the discharge is only temporary, as in the case of the lightning discharge, or the case of a person falling against the wires and remaining in contact therewith but a few seconds or fractions of a second.